

CLAIMS

1. An induction heater comprising an induction heating coil which produces a high-frequency magnetic field to heat an object to be heated (hereinafter: object), an inverter circuit which supplies a high-frequency current to said induction heating coil, an output detection section for detecting the magnitude of the output of said inverter circuit, a control section for controlling the output of said inverter circuit in response to the output of said output detection section, a setting input section for setting a target output to be controlled by said control section, a first movement detection section for detecting a movement of said object, and a storage section for storing a control value output by said control section or an output value of said output detection section before said first movement detection section detects the movement of said object, wherein

said control section has a reach control mode where the output of said inverter circuit is increased from a low output to said target output gradually, a stable control mode where said inverter circuit is controlled so that the output

of said inverter circuit agrees with said target output, and a first output mode where a control value derived from the control value or the output value of said output detection section stored in said storage section is output, or an output value derived from the control value or the output value of said output detection section stored in said storage section is set as a new target output, and said inverter circuit is controlled so that the output of said inverter circuit agrees with the new target output, and when said first movement detection section detects a movement of said object, said control section shifts to said first output mode.

2. An induction heater in accordance with claim 1, wherein, when a predetermined time period elapses in said first output mode, said control section shifts to said reach control mode.

3. An induction heater in accordance with claim 1, wherein, in said first output mode where said control section outputs the control value derived from the control value or the output value of said output detection section stored in said storage section, when the

difference between the output value of said output detection section stored in said storage section at the previous time and the output value of said output detection section newly stored therein is within a predetermined range, and a predetermined time period has elapsed since the shift to said first output mode, said control section changes said target output value set by said setting input section into the value derived based on the output value of said output detection section stored in said storage section, or

in said first output mode where said control section sets the output value derived from the control value or the output value of said output detection section stored in said storage section as the new target output and controls said inverter circuit so that the output of said inverter circuit agrees with the new target output, when the difference between the control value or the output value of said output detection section stored in said storage section at the previous time, and the control value or the output value of said output detection section newly stored in said storage section is within a predetermined range, and a predetermined time

period has elapsed since the shift to said first output mode, said target output value set by said setting input section is changed into the value derived based on the control value or the output value of said output detection section stored in said storage section.

4. An induction heater in accordance with claim 3, having a setting display section for displaying said target output value set by said setting input section, wherein said setting display section changes the display in response to the control value output by said control section or the output value of said output detection section which have been stored in said storage section.

5. An induction heater in accordance with claim 1, having a second movement detection section which determines that said object has moved when said first movement detection section detects movements of said object successively in said first output mode, wherein, when said second movement detection section detects the movement of said object, said control section changes the output of said inverter circuit in said first

output mode into a value lower than before.

6. An induction heater in accordance with claim 5, wherein, in lowering the output of said inverter circuit in said first output mode, said control section gradually reduces the output.

7. An induction heater in accordance with claim 1 or 5, wherein when said target output value set by said setting input section exceeds a predetermined value, said control section corrects a threshold value with which said first movement detection section or said second movement detection section determines that said object has moved with a predetermined value.

8. An induction heater in accordance with claim 3, wherein when the value for use in changing said target output value set by said setting input section, which is derived based on the control value output by said control section or the output value of said output detection section which have been stored in said storage section is less than a predetermined value, said control section stops heating.

9. An induction heater in accordance with claim 1, wherein when the difference between the set output value and the output value of said output detection section is within a predetermined range in said stable control mode, said control section fixes a control value as a second output mode for at least a predetermined time period.

10. An induction heater in accordance with claim 1, having a movement state detection section for determining whether said object has been moved by the outside force or the movement thereof has been caused by the repelling magnetic field in said stable control mode, wherein when said movement state detection section determines that the movement thereof has been caused by the repelling magnetic field, the shift to said first output mode is made.

11. An induction heater in accordance with claim 10, wherein, in said stable control mode, according to whether or not the periods of the change in the output value of said output detection section, the control value of said control section, or the weight of said object are

within a predetermined range, it is checked whether the movement of said object has been caused by the repelling magnetic field or said object has been moved by the outside force.

12. An induction heater in accordance with claim 1, further having a third movement detection section for detecting a movement of said object based on the fact that said control section has increased the control value continuously so as to increase the output of said inverter circuit in said stable control mode, wherein when said third movement detection section detects the movement of said object, the shift to said first output mode is made.

13. An induction heater in accordance with claim 1 or claim 10, wherein when shifting from said reach control mode or said stable control mode to said first output mode, said control section outputs a correction value obtained by correcting the control value stored in said storage section with a first correction value or a correction value such that the output value obtained by correcting the output value of said output detection section stored in said

storage section with a first correction value can be gained, whereas when shifting from said first output mode to said reach control mode, said control section outputs a control value obtained by correcting the control value stored in said storage section with a second correction value or a correction value such that the output value obtained by correcting the output value of said output detection section stored in said storage section with a second correction value can be gained, and said first correction value is set greater than said second correction value.

14. An induction heater in accordance with claim 1 or claim 5, wherein in the case where the set target output value is greater than a predetermined value, said control section does not lower the output even when said first movement detection section or said second movement detection section detects the movement of said object.

15. An induction heater comprising an inverter including an induction heating coil which produces a high-frequency magnetic field to heat an object, a control section for controlling

the output of said inverter, and a movement detection section which detects a state of operation of said inverter or a state of said object until the output of said induction heating coil increases gradually from a low output to a predetermined output to detect a movement of said object, wherein

when said movement detection section performs the movement detection operation for detecting the movement of said object, said control section performs the output limiting operation for limiting the output of said induction heating coil to a value lower than the value when the movement thereof has been detected or stopping the heating, afterwards, repeats at least once the process of canceling said output limiting operation, increasing the output gradually again, performing said movement detection operation, and performing said output limiting operation, and when detecting that said movement detection operation is repeated with approximately the same output changes, said control section determines that the movement of said object has been caused by the high-frequency magnetic field produced by said induction heating coil, thereby limiting the output of said

induction heating coil thereafter to the output lower than the output when said movement detection section has detected the movement of said object to carry out heating.

16. An induction heater in accordance with claim 15, wherein said control section samples the output values of said inverter, the control values output by said control section, or the weight of said object when said movement detection section detected a movement of said object a plurality of times, and based on a plurality of values obtained through the sampling, determines whether or not the movement of said object has been caused by the high-frequency magnetic field produced by said induction heating coil.

17. An induction heater in accordance with claim 16, wherein said control section compares a plurality of values obtained through sampling or performs the calculation thereamong, and when determining that said plurality of values are approximately the same, said control section determines that said object has been moved by the high-frequency magnetic field

produced by said induction heating coil.

18. An induction heater in accordance with claim 15, wherein said control section detects the time required for the repetition of said movement detection operation and, according to the change of the time, determines whether or not a movement of said object has been caused by the high-frequency magnetic field produced by said induction heating coil.

19. An induction heater in accordance with claim 18, wherein said control section measures the repetition period of said movement detection operation a plurality of times, compares a plurality of values obtained by measurement or performs the calculation thereamong, and when a plurality of values are approximately the same, said control section determines that said object has been moved by the high-frequency magnetic field produced by said induction heating coil.

20. An induction heater in accordance with claim 15, wherein when detecting that the movement of said object has been caused by the

user's operation after having performed the output limiting operation based on the result of the detection done by said movement detection section, said control section cancels said output limiting operation to increase the output of said induction heating coil to a predetermined output.

21. An induction heater in accordance with claim 15, having a display section for providing a display corresponding to the output set by a user, wherein even when said control section starts the output limiting operation based on the result of the detection done by said movement detection section, said display section maintains the display corresponding to said set output, whereas after determining that the movement of said object has been caused by the high-frequency magnetic field produced by said induction heating coil, said control section reduces the output to be displayed to the output lower than the displayed output corresponding to said output.

22. An induction heater in accordance with claim 15, wherein according to the change of the output of said inverter, the control value

output by said control section or the weight of said object with time, said movement detection section detects a movement of said object resulting from the high-frequency magnetic field produced by said induction heating coil.

23. An induction heater comprising:

an induction heating coil which produces a high-frequency magnetic field to heat an object;

an inverter circuit which supplies a high-frequency current to said induction heating coil;

an input section for making a setting of the heating;

a movement detection section for detecting a movement of said object; and

a control section which controls the output of said inverter circuit, and when said movement detection section detects a movement of said object, performs the limiting operation to stop or limit the output of said inverter circuit, wherein

according to the settings at said input section, the detection sensitivity of said movement detection section is decreased or the

detection thereof is stopped, or said limiting operation of said control section is weakened or is not performed.

24. An induction heater in accordance with claim 23, wherein said input section has a heating output setting section for setting heating output, and according to the heating output set at said heating output setting section, the detection sensitivity of said movement detection section is decreased or the detection thereof is stopped, or said limiting operation of said control section is weakened or is not performed.

25. An induction heater in accordance with claim 24, wherein when the set value of the heating output at said heating output setting section becomes equal to or greater than a predetermined value, the detection sensitivity of said movement detection section is decreased or the detection thereof is stopped, or said limiting operation of said control section is weakened or is not performed.

26. An induction heater in accordance

with claim 23, wherein when said movement detection section detects a movement of a load, according to the settings of said input section, selection between the continuation of the heating output and the stop thereof is made.

27. An induction heater in accordance with claim 23, wherein when a setting section which said input section has in addition to said heating output setting section is used, the detection sensitivity of said movement detection section is decreased or the detection thereof is stopped, or said limiting operation of said control section is weakened or is not performed.

28. An induction heater in accordance with claim 23, wherein when a change input section provided independently in said input section is used, the detection sensitivity of said movement detection section is decreased or the detection thereof is stopped, or said limiting operation of said control section is weakened or is not performed.

29. An induction heater in accordance with claim 28, wherein said change input section

has a fry cooking selection section for carrying out fry cooking, and when the "fry cooking" is selected, the detection sensitivity of said movement detection section is decreased or the detection thereof is stopped, or said limiting operation of said control section is weakened or is not performed.

30. An induction heater comprising:

an induction heating coil which produces a high-frequency magnetic field to heat an object;

an inverter circuit which supplies a high-frequency current to said induction heating coil;

an output detection section for detecting the magnitude of the output of said inverter circuit;

a movement detection section for detecting a movement of said object;

a control section for controlling the output of said inverter circuit in response to the output of said output detection section and the output of said movement detection section;
and

a movement detection stop input section

for inputting a stop command to stop the detection operation of said movement detection section or to make said control section stop controlling the output in response to the output of said movement detection section.

31. An induction heater in accordance with claim 30, having a first timer section which starts timing in association with the input operation to said movement detection stop input section, wherein until a predetermined time period elapses after said first timer section starts timing, said control section performs control regardless of whether said object has moved or not.

32. An induction heater comprising:
an induction heating coil which produces a high-frequency magnetic field to heat an object;

an inverter circuit which supplies a high-frequency current to said induction heating coil;

an output detection section for detecting the magnitude of the output of said inverter circuit;

a movement detection section for detecting a movement of said object;

a control section for controlling the output of said inverter circuit in response to the output of said output detection section and the output of said movement detection section; and

an output fixation input section for inputting an output fixation command, wherein

when said output fixation command is input, said control section fixes the output of said inverter circuit regardless of whether said object has moved or not.

33. An induction heater in accordance with claim 32, having a second timer section which starts timing in association with the input of said output fixation command to said output fixation input section, wherein when the time measured by said second timer section becomes equal to or longer than a predetermined time period, said control section cancels the fixation of the output of said inverter circuit.

34. An induction heater in accordance with claim 32, wherein said control section fixes

the output of said inverter circuit only while said output fixation input section inputs said output fixation command.

35. An induction heater in accordance with claim 32 having an fixed output setting section for adjusting the output of said inverter circuit to be fixed at said output fixation input section.